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## Análise do perfil sociodemográfico de notificados para hepatite B e imunização contra a doença

Sociodemographic analysis of reported hepatitis B and immunization against the disease

Análisis sociodemográfico del reportado hepatitis B y la inmunización contra la enfermedad

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### ABSTRACT

**Objective:** To analyze the socio-demographic profile of reported hepatitis B and immunization against the disease. **Methods:** Study Hepatitis B notification data in the surveillance of a Minas Gerais' municipality, from 2007 to 2015, conducted at the Labor Education Program for Health descriptive and analytical statistics, with significance level of  $p < 0.05$ . **Results:** 132 cases and two deaths were notified. The age of the reported cases ranged from zero to 87 years, average 35.8 ( $\pm 14.0$ ) years. More frequently for men (52.3%) and with low education (64.8%). Most of them did not vaccinate (81.8%) and had positive result of HSBsAg serology (90.1%); immunization was not linked to the socio-demographic profile ( $p > 0.05$ ). **Conclusion:** Age, education and gender were not associated with immunization, vaccination schedule and the HSBsAg test. The absence of vaccination among the notified suggests need for health education among the population, orienting the possibility of protection by immunization.

**Descriptors:** Hepatitis B, Hepatitis B Vaccines, Public Health, Epidemiological Surveillance.

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## RESUMO

**Objetivo:** Analisar o perfil sociodemográfico dos notificados para hepatite B e a imunização contra a doença. **Métodos:** Estudo com dados de notificação de hepatite B na vigilância epidemiológica do município de Minas Gerais, entre 2007 a 2015, conduzido no Programa de Educação pelo Trabalho para a Saúde. Estatística descritiva e analítica, com nível de significância  $p < 0,05$ . **Resultados:** Notificaram-se 132 casos e dois óbitos. A idade dos notificados variou de zero a 87 anos, média de 35,8 ( $\pm 14,0$ ) anos. Maior frequência para homens (52,3%) e baixa escolaridade (64,8%). A maioria não vacinou (81,8%) e teve resultado da sorologia HSBsAg positivo (90,1%); a imunização não se associou ao perfil sociodemográfico ( $p > 0,05$ ).

**Conclusão:** Idade, escolaridade e sexo não foram associados à imunização, ao esquema vacinal ou ao teste HSBsAg. A ausência de vacinação entre os notificados sugere a necessidade de educação em saúde junto à população, orientando-a sobre possibilidade de proteção pela imunização.

**Descritores:** Hepatite B, Vacinas contra Hepatite B, Saúde Pública, Vigilância Epidemiológica.

## RESUMEN

**Objetivo:** Analizar el perfil sociodemográfico reportado de hepatitis B y la inmunización contra la enfermedad. **Métodos:** Estudio de datos de notificación de la hepatitis B en la vigilancia del municipio de Minas Gerais, de 2007 a 2015, realizadas en el Programa de Educación para el Trabajo de estadística descriptiva y analítica de la Salud, con un nivel de significación de  $p < 0,05$ . **Resultados:** 132 casos fueron notificados; dos muertes. La edad del reportado varió de cero a 87 años, con una media de 35,8 ( $\pm 14,0$ ) años. Con mayor frecuencia entre los hombres (52,3%) y baja educación (64,8%). La mayoría no vacunados (81,8%) y tuvo resultado positivo de HSBsAg serología (90,1%); la inmunización no vinculado al perfil sociodemográfico ( $p > 0,05$ ). **Conclusión:** La edad, la educación y el sexo no se asociaron con la inmunización, calendario de vacunación y la prueba HSBsAg. La ausencia de vacunación entre los notificados sugiere la necesidad de educación para la salud entre la población, orientando la posibilidad de protección mediante la vacunación.

**Descriptores:** Hepatitis B, Vacunas contra Hepatitis B, Salud Pública, Vigilancia Epidemiológica.

## INTRODUCTION

Hepatitis B is a chronic disease transmitted through skin lesions and mucosa, sexual relations, percutaneous exposure to needles or other contaminated instruments, blood transfusions, dialysis procedures, dental, among others.<sup>1</sup>

The World Health Organization (WHO) estimates that in the world, there are about 325 million people with hepatitis B virus (HBV), two million just in Brazil.<sup>2-3</sup> Brazil is among the countries with high rates of HBV infection and the fatality rate of hospitalized patients is 0.8 to 2% and may increase in individuals over 40 years old.<sup>1</sup>

Suspected cases of infection of the disease should be reported in epidemiological surveillance and conducted tests to confirm or not the contagion, and, if needed, initiate the appropriate treatment. Viral hepatitis are considered notifiable diseases since 2006.<sup>2</sup> After infection, the incubation period ranges from 30 to 180 days, and the disease divided into acute and chronic phase. The latter

refers to persistent infection for more than six months.<sup>1</sup> The chronicity of the disease negatively impacts the quality of life of infected individuals, and may cause stress, interfere with social relationships and in performing daily tasks. Moreover, there is increased risk of hepatic decompensation, cirrhosis, hepatocellular carcinoma, among others.<sup>3</sup>

Prevention of disease is carried out by vaccination, which from the 1990s came to be provided free by the Unified Health System (SUS). It consists of three doses, the first being applied in the first 12-24h life.<sup>4</sup> After completing the vaccination schedule is interesting that tests be conducted to verify the individual seroconversion, or confirm the development of sufficient anti-HBs antibodies against hepatitis B.<sup>5</sup>

The aim of this study was to analyze the demographic profile of reported hepatitis B and immunization against disease.

## METHODS

The research project was approved by the Ethics in Research Committee involving human beings of the State University of Montes Claros (Unimontes) seem embodied nº 437 086, in respect to Resolution 466/2012 of the National Council of Health, Ministry of Health and the ethical principles of declaration of Helsinki. It was also important the institutional consent of the Municipal Department of Health, Epidemiological Surveillance sector of the city of Montes Claros/Minas Gerais, Brazil. The municipality is of medium size, with a population estimated at 390,000 inhabitants. The study has the documentary design with a cross and quantitative approach, and was developed with data compulsory reporting forms for hepatitis B between 2007 and 2015. The research was carried out under the Education Program for Working for Health Surveillance in Health (PET-HEALTH/VS).

Data collection occurred in September 2015, from a form that included the following variables: year of notification, sociodemographic notified to health issues, vaccination (complete, incomplete or unvaccinated) and results of HbsAg serology. For the socio-demographic profile of notified people were assessed: gender (female, male), age (represented by children life cycle and adolescents up to 17 years, adults 18-59 years old and older with more than 60 years) and education (illiterate, complete or incomplete 1<sup>st</sup> degree, complete or incomplete 2<sup>nd</sup> degree, complete or incomplete higher education). In Brazil, the first full degree is equivalent to nine years of study; a high school education, to 12 years of study; the incomplete higher education, for more than 12 years, and completed higher level depends on the completed course, suffering from years variation for the payment (generally four to six years of graduation). For statistical analysis it was grouped the categories 2 full degree/incomplete and complete higher level, and the relative ages of the children and adolescents due to the small number of cases reported in each of these categories. In addition to the year of

the notification and the socio-demographic profile, identified the number of deaths among reported for hepatitis B.

Statistical analysis involved descriptive analysis by calculating the absolute and percentage values and, crossing the variables serology for HBsAg and vaccination schedule with the socio-demographic profile of individuals reported to hepatitis B by Pearson's chi square or its alternative Likelihood ratio. To compare the average ages of the notified people as vaccination schedule, complete, incomplete or unvaccinated used the nonparametric Kruskal-Wallis, due to non-normality of the data. It was considered for all tests the significance level of  $p < 0.05$ .

## RESULTS

Between the period from 2007 to September 2015 were reported 132 cases of hepatitis B, with higher prevalence in 2007 (24.2%) and 2012 (15.2%). In 2015 cases decrease was observed, with a total of two cases reported until September (Table 1). The death record was reported for two cases, one with 31 years old and another with 57, one in 2008 and another in 2012. These two cases referred to the male and education compatible to the 2<sup>nd</sup> full extent, for example 12 years of study.

**Table 1** - Distribution of notifications for hepatitis B as the year of notification

Year	N	%
2007	32	24.2
2008	19	14.4
2009	18	13.6
2010	8	6.1
2011	5	3.8
2012	20	15.2
2013	18	13.6
2014	10	7.6
2015 until September	2	1.5
Total	132	100.0

The age range of those reported people ranged from zero to 87 years, with a grade average of 35.8 ( $\pm 14.0$ ) years. The age of up to 26 years was observed in 25% of cases, 50% was up to 35 years and 75% were age up to 44 years. Only three children aged up to two years, have been reported. The teenagers were also in number of three cases, one aged 16 and two aged 17; adults (18-59 years) accounted for the most affected group, with 90.2% of cases and only six elderly (60-87 years) have been reported.

The predominance of notifications was male, with 52.3%. The level of education was recorded in the records of only 54 people, and most of these (64.8%) had the 2<sup>nd</sup> grade incomplete (Table 2).

**Table 2** - Profile of patients with hepatitis B on the gender and education

Variable		N	%
Gender	Female	63	47.7
	Male	69	52.3
	Total	132	100
Education	2° Grade incomplete	35	64.6
	2° Grade complete	16	29.6
	Complete college education	1	1.9
	Incomplete college education	2	3.7
	Total	54	100.0

The positive results of serology HSBsAg confirmed the disease to 90.1% of 121 people who have undergone this examination. Crossing the profile of patients with hepatitis B with the test result, there was a predominance of positivity in men, adults and those with not completed high school, but without statistical significance (Table 3).

**Table 3** - HBsAg serology result according to the socio-demographic profile of reported hepatitis B

Variable		Serology results: HBsAg						p
		Reagent		Non reactive		Total		
		n	%	n	%	n	%	
Gender	Female	53	89,8	6	10,2	59	100,0	0,928
	Male	56	90,3	6	9,7	62	100,0	
	Total	109	90,1	12	9,9	121	100,0	
Age	Children/Adolescents	5	100,0	0	0,0	5	100,0	0,299
	Adults	98	89,1	12	10,9	110	100,0	
	Elderly	6	100,0	0	0,0	6	100,0	
	Total	109	90,1	12	9,9	121	100,0	
Education	2° Grade incomplete	29	90,6	3	9,4	32	100,0	0,103
	2° Grade complete or higher	17	100,0	0	0,0	17	100,0	
	Total	46	93,9	3	6,1	49	100,0	

The record about vaccination or not against hepatitis B was identified in 66 reporting forms. In these, 81.8% of reported did not receive the vaccine, 10.6% received the full vaccination schedule of three doses and 7.6% did not complete the vaccination schedule. The average age of the notified according to the vaccination schedule, the average age for those with full scheme was 31.4 years ( $\pm 13.25$ ), incomplete was 32.0 years ( $\pm 19.41$ ) and unvaccinated the average was 38.8 years ( $\pm 14.99$ ), with no significant difference between the average age ( $p = 0.195$ ). The complete vaccine scheme showed a higher frequency among male reported in adults and between those who have the 2<sup>nd</sup> degree incomplete, with no statistical difference (Table 4).

**Table 4** - Vaccination schedule for hepatitis B as socio-demographic profile of the notified

		Vaccination				p
		Sociodemographic profile Complete	Incomplete	Not vaccinated	Total	
		n (%)	n (%)	n (%)	n (%)	
Gender	Female	3(7.9)	4(10.5)	31(81.6)	38(100.0)	0.419
	Male	4(14.3)	1(3.6)	23(82.1)	28(100.0)	
	Total	7(10.6)	5(7.6)	54(81.8)	66(100.0)	
Age	Children/Adolescents	0(0.0)	0(0.0)	2(100.0)	2(100.0)	0.718
	Adults	7(11.5)	5(8.2)	49(80.3)	61(100.0)	
	Elderly	0(0.0)	0(0.0)	3(100.0)	3(100.0)	
	Total	7(10.6)	5(7.6)	54(81.8)	66(100.0)	
Education	2° Grade incomplete	3(14.3)	0(0.0)	18(85.7)	21(100.0)	0.096
	2° Grade complete or higher	0(0.0)	1(9.1)	10(90.9)	11(100.0)	
	Total	3( 9.4)	1(3.1)	28(87.5)	32(100.0)	

## DISCUSSION

This article brought the analysis of the results of serology HBsAg and immunization against hepatitis B as the socio-demographic profile of people reported in the city of Montes Claros/Minas Gerais, from 2007 to 2015. For almost a decade, there was a trend decreasing cases between 2007 and 2011, equivalent to 640.0% reduction in reported cases of hepatitis B; unlike the period between 2012 and 2014, there was an increase of 400.0%, and again observed a decline from 2012 to 2014 to 50.0% in the cases. The data suggest that 2015 was the lowest number of cases, as to the month of September only two cases had been reported. The reduction of cases reported in the municipal epidemiological surveillance industry can be explained by several reasons, such as failure to notify the health units or less contact with the virus or greater control of viral infection in the city. It should be noted, there cord of two deaths among cases reported with hepatitis B.



Hepatitis B is a disease that affects people around the world and presents itself as a public health problem, because of their ability to become chronic, causing liver cirrhosis and hepatocellular carcinoma, it is considered the most severe viral hepatitis,<sup>6</sup> so it is essential to adopt educational measures and prevention, control and treatment of this pathology in order to reduce cases.

This study indicated a predominance of males among reported for hepatitis B, and also confirmed for HBsAg serology was prevalent for men. Corroborating this article, a work in Manaus/AM, Brazil, from 1997 to 2001, showed a higher prevalence of HBV infection in men, with 70.2% of the total.<sup>7</sup> Accordingly, another study conducted in the state of Pará found predominance of men over women, with 62.6% of those infected.<sup>8</sup> This higher incidence of the disease in men reflects a possible increased risk behavior among them, hypothetically by contamination through sex with multiple partners and lack of protection in this regard.

Diverging expectations regarding gender, a case-control study in São Mateus/Espírito Santo, Brazil, found prevalence of hepatitis B in females. However, if justified in the fact that women are more active in the search for medical consultations, examinations and greater concern with self-care and health and, therefore, have been the most diagnosed with this disease.<sup>9</sup>

The route of most common transmission for hepatitis B is sexual, therefore, the age group of youth and adults who possibly has sexually active would be more exposed to contamination with HBV. Thus, one can explain the higher number of cases in the adult stage of life in this study. Other research done in the country, also confirm the higher prevalence in adults, the group between 20 and 40 years old were the most affected and that can relate to increased risk of infection through sexual intercourse.<sup>10,11</sup>

The route of most common transmission for hepatitis B is sexual, therefore, the age group of youth and adults who possibly has sexually active life would be more exposed to contamination with HBV. Thus, this can explain the higher number of cases in the adult stage of life in this study. Other research done in the country, also confirm the higher prevalence in adults, the age group between 20 and 40 as the most affected and that can relate to increased risk of infection through sexual intercourse.<sup>6</sup> Unlike the present study, we found a very small number of adolescents affected by hepatitis B, only three cases in the period of almost a decade.

According to the National Survey conducted by the Ministry of Health (MS) in 2011, the percentage positive for HBV was 1.1% for ages 10 to 19 years old and 11.6% for the age group of 20 to 69 years old.<sup>12</sup> The frequency found for children and adolescents in this study, was also low (5.3%), as well as in the survey conducted between 2001-2011, Paraná, who observed small values in the age group of zero to nine years, which It reflects the good response to immunization performed in children. Already, the higher age groups have higher incidences, both for non-vaccination in these

ages, which were not initially covered by the vaccine basic calendar, which implemented the vaccine against HB, but also at higher risk of infection through sexual transmission,<sup>6</sup> as previously stated.

Level of education was selected for analysis in this study, but it was recorded in only 54 reporting forms HB, losing this information for 78 cases. Failure to complete, by the health workers, data required in notifications forms brings loss and limits the epidemiological study by the lack of important information for global characterization of the socio-demographic profile of patients with hepatitis B. For the valid records, most individuals had not completed high school. However, testing for HBsAg positive was not associated with low education.

Another study found a correlation between hepatitis B with the lowest education. The higher prevalence of HBV infection was for residents in rural areas, which can be explained by the difficulty of access to health and education services for the rural population.<sup>9</sup> Survey noted that 29.9% of those infected with HBV were illiterate and 70.1% had primary education only.<sup>13</sup> Thus, we see the need to invest in health education, informing the public about the means of contamination, prevention and treatment of hepatitis B, as the highest prevalence among those with less education, in order to enable them to self care against infection from hepatitis virus.

Immunisation against HBV was a key factor in reducing the prevalence rates of disease worldwide. In this study, only 66 reporting forms were filled to the topic of vaccination, which reflects another failure of professionals responsible for notification, bringing limitations in epidemiological studies. In addition, there is the bias of memory that can interfere with the results of this variable, since the person cannot respond correctly to their vaccination status. Among the valid records, more than 80.0% of people have not been vaccinated against hepatitis B, and the high frequency due to the acquired protection effectiveness with vaccination.

The lack of knowledge about the pathology and the low perceived susceptibility are factors related to the lack of adherence to the vaccine.<sup>14</sup> Also, they are among the main reasons for not being vaccinated against hepatitis B the deficit in training and poor education.<sup>15</sup> Thus, it can be inferred that the lack of information leads to a cascade effect, less adherence to immunization and therefore less protection to infection by hepatitis B.

Agreeing with this study, a survey conducted in Campinas/SP, revealed no differences between the vaccine coverage and the profile of the cases analyzed in relation to gender, age, family income and education.<sup>16</sup> In Brazil, vaccination against hepatitis B has been implemented since 1989 by the National Immunization Program of the Ministry of Health (PNI/MS). Initially, the vaccine was approved for children under one year of age in the western Amazon region and later, after ten years, for the whole country. Immunization is performed in three doses, and its response is satisfactory, since the vaccine

is highly immunogenic for over 90% of adults and 95% of healthy children and adolescents.<sup>6</sup>

As a result of vaccination, there was reduction of endemicity of hepatitis B from the 1990s, the main way to prevent infection with HBV. In this sense, the PNI/MS extended immunization for children under 20 years of age. However, for those population groups most susceptible to infection, from 2011 it was made available to vaccine for the age groups between 20 and 24 years and, in 2012, to 29 years of age. There are other population groups more vulnerable and, therefore, the public health system provides immunization against HBV regardless of age for manicures, fire, blood donors, garbage collectors, truck drivers and healthcare professionals. The PNI/MS adopted vaccination with one dose in the first 12 hours of life every newborn, regardless of the mother's serologic stage, as there is baby contamination risk during childbirth. Immunisation prevents this vertical transmission in 90% of cases and the mother can breastfeed your child without the risk of infecting him.<sup>6</sup> This measure may explain the very small number of children reported in the current study.

Also immunization against hepatitis B decreased in recent years to HBV infection in health care workers, which can be associated with vaccination in this risk group as well as adoption of standard precautionary measures.<sup>17</sup> However, a study conducted with health workers of a hospital in Minas Gerais found that most, although immunized against HBV, did not seek to confirm the immunization test for anti-HBs. Not knowing the immune status on the virus of the disease, these professionals still at risk of becoming infected in the event of an occupational accident with contaminated biological material. The highest rate of immunization and search for confirmation of the immune status against the disease is among younger workers, who possibly had the opportunity of updates and information on the relevance of this protection in case of biological accident.<sup>18</sup>

The limitations found in the work, in general, refer to the lack of information on topics of notifications chips, which can interfere with the global observation of the population group studied the municipality.

## CONCLUSION

The decrease of cases in the following years, from 2007, suggests improvement in the health status of the population and the hepatitis B infection in a medium-sized city in Minas Gerais, Brazil. Among the reported cases, most people had not been vaccinated, or did not receive the full protection vaccination schedule against hepatitis B. Despite the injury has reached more often males, adults and people with less education, this demographic profile was not associated with the outcome of HBsAg serology and complete vaccination schedule, incomplete or unvaccinated. In order to reduce hepatitis B in the population it is essential that health professionals and services to invest in prevention and health

education. Discuss with the population the possibility of immunization against the disease is of paramount importance. Through the complete vaccination and testing to prove the protective response can prevent HBV infection, reflecting positively on public health, breaking the chains of transmission of this disease. Health education must be thought also to health professionals for proper filling of all fields of the notification form; because they are fundamental in defining the socio-demographic profile of patients with hepatitis B and use both for surveillance and for planning actions from the assessment and monitoring of data.

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